TROUBLESHOOTING

If a battery has tested good and then has not performed satisfactorily in service for no apparent reason, the following are some of the more important factors that may point to the cause of trouble:

1. Vehicle accessories inadvertently left on overnight.
2. Defects in the charging system, such as slipping fan belt, high wiring resistance, faulty generator or regulator.
3. A vehicle electrical load exceeding the generator capacity, with the addition of electrical devices, such as radio equipment, air-condition, window defoggers or light systems.
4. Defects in the electrical system, such as shorted or pinched wires.
5. Extended slow speed driving with many accessories turned on.
6. Loose or poor battery cable-to-post connections, previous improper charging of a run-down battery, or loose hold-downs.
7. High-resistance connections or defects in the cranking system.
8. Long periods of vehicle storage without disconnecting the battery or batteries. Small current drains of vehicle accessories which are connected all the time can discharge the battery or batteries in a six- to eight-week period. Batteries left in a discharged condition for a prolonged period of time are subject to freezing and can become difficult to recharge.

JUMP STARTING IN CASE OF EMERGENCY WITH AUXILIARY (BOOSTER) BATTERY

Both booster and discharged battery should be treated carefully when using jumper cables. Follow exactly the procedure outlined below, being careful not to cause sparks:

1. Set parking brake and place automatic transmission in "PARK" (neutral for manual transmission). Turn off lights, heater and other electrical loads. Observe charge indicator. If indicator is light, replace battery. If charge indicator is dark and has a green dot in the center, failure to start is not due to a discharged battery and the cranking system should be checked. If charge indicator is dark but the green dot does not appear in center, proceed as follows:

NEGATIVE GROUND ONLY

2. Attach one end of one jumper cable to the positive terminal of the **booster battery** and the other end of same cable to positive terminal of **discharged battery.** DO NOT PERMIT vehicles to touch each other as this could establish a ground connection and counteract the benefits of this procedure.
3. Attach one end of the remaining negative cable to the negative terminal of the **booster battery** and the other end to a ground at least 12 inches from the battery of the vehicle being started. (DO NOT CONNECT DIRECTLY TO THE NEGATIVE POST OF THE DEAD BATTERY.)

POSITIVE GROUND ONLY

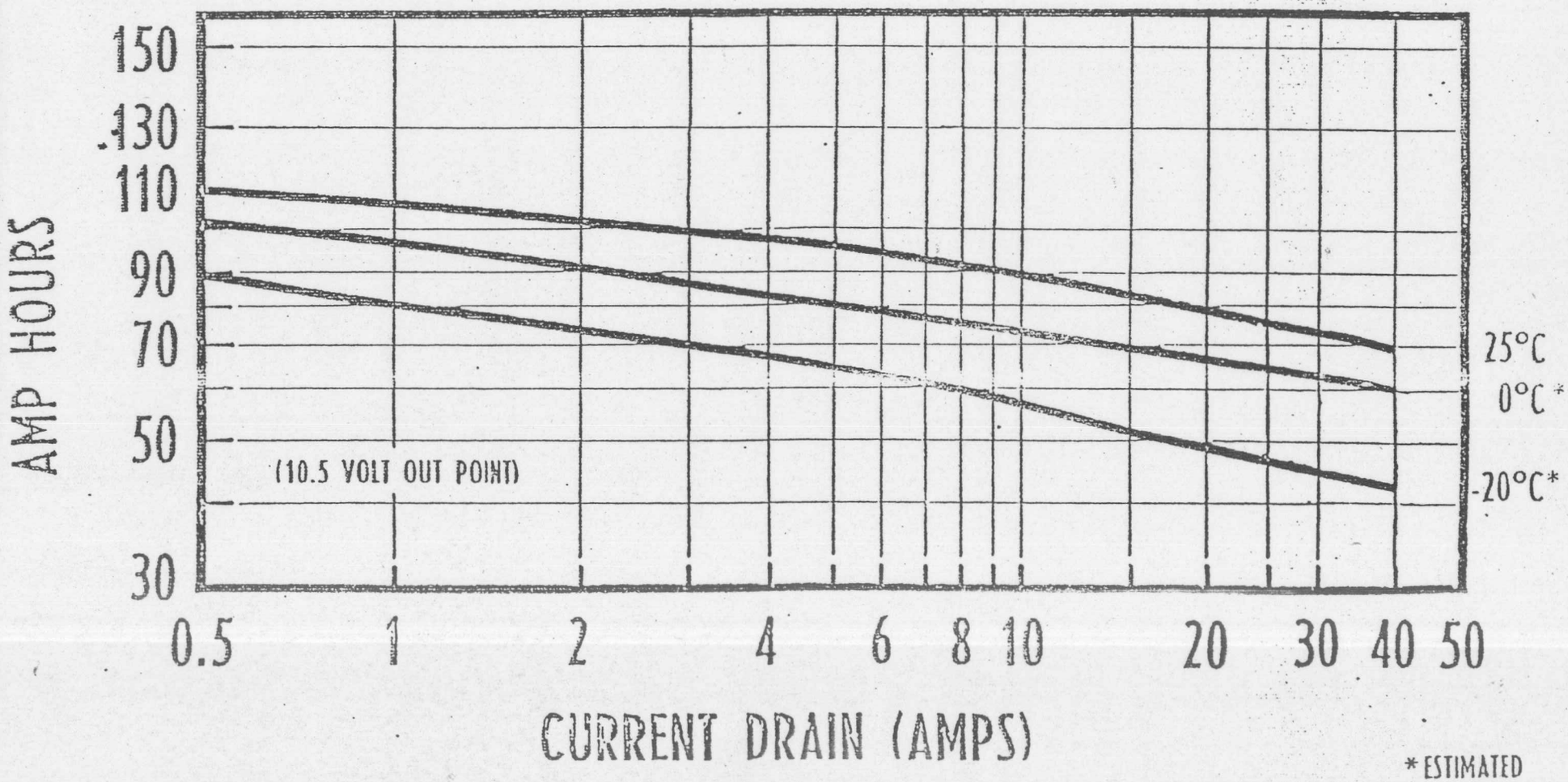
4. Attach one end of one jumper cable to the negative terminal of the **booster battery** and the other end of the same cable to negative terminal of **discharged battery.** DO NOT PERMIT vehicles to touch each other, as this could establish a ground connection and counteract the benefits of this procedure.
5. Attach one end of the remaining positive cable to the positive terminal of the **booster battery** and the other end to a ground at least 12 inches from the battery of the vehicle being started. (DO NOT CONNECT DIRECTLY TO THE POSITIVE POST OF THE DEAD BATTERY.)

NEGATIVE GROUND AND POSITIVE GROUND

6. Take care that the clamps from one cable do not inadvertently touch the clamps on the other cable. Do not lean over the battery when making connections. The ground connection must provide good electrical conductivity and current carrying capacity. Avoid moving hot or electrical hazards such as fans, manifolds and spark plug terminals.
7. Reverse this sequence exactly when removing the jumper cables.

WARNING: Any procedure other than the above could result in: 1) personal injury caused by electrolyte squirting out the battery vent, 2) personal injury or property damage due to battery explosion, 3) damage to the charging system of the booster vehicle or of the immobilized vehicle.

DELCO ~~1150~~ 2000 CAPACITY



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Lew Leathwaite
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Delco Remy FREEDOM BATTERIES

Service Bulletin 1B-116

Pages: 8

Date 10-1-80
Supersedes
Service Bulletins
Dated 12-1-78, 3-1-77, 6-1-76
11-15-74 and 6-1-74

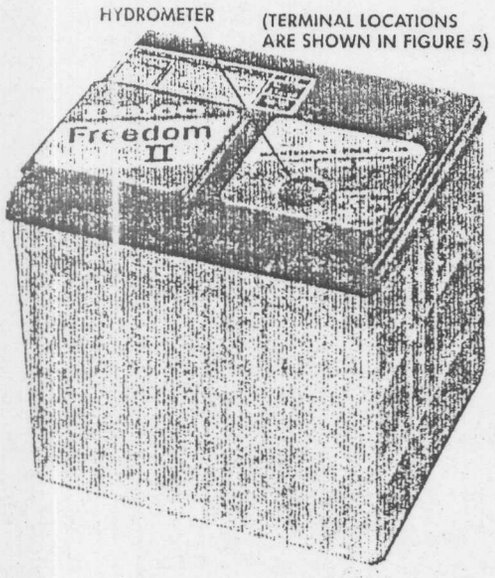

Figure 1—Typical Passenger Car Freedom Battery with Sealed Terminals

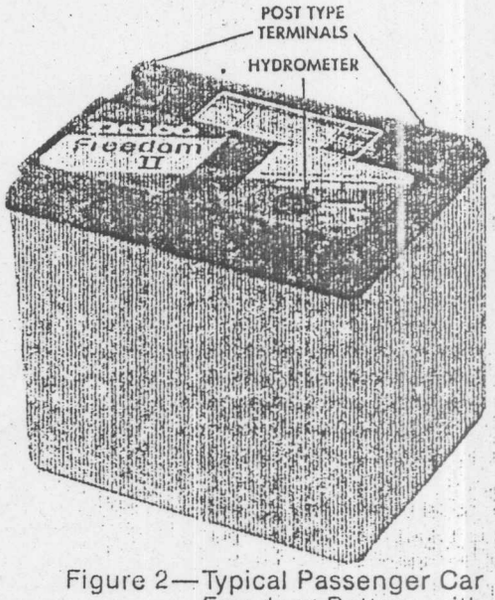

Figure 2—Typical Passenger Car Freedom Battery with Posts

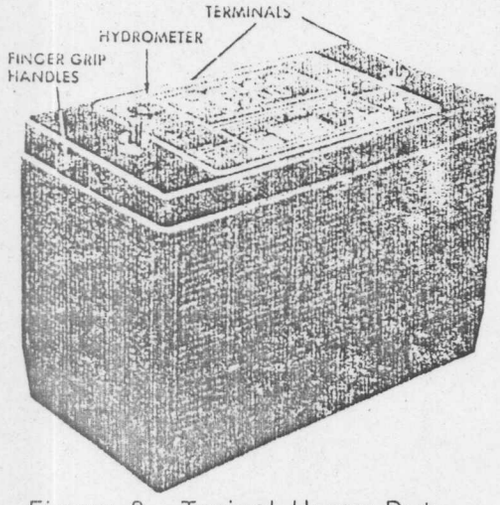

Figure 3—Typical Heavy-Duty Freedom Battery

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